



M^cCAIGINSTITUTE
FOR BONE AND JOINT HEALTH



STRATEGIC PLAN

2021 - 2026



UNIVERSITY OF CALGARY
CUMMING SCHOOL OF MEDICINE

Mobility for Life.



VISION

Leading the improvement of musculoskeletal health for patients across their lifespan through research and education.

MISSION

To enhance the musculoskeletal health of Albertans by focusing our efforts on a “precision medicine” approach to research: tailoring the right intervention for patients at the right time.

CORE VALUES

Solution Driven — We place the patient and community health needs at the forefront of our work, striving for faster and better health outcomes for people suffering from bone, muscle, and joint conditions.

Commitment to Excellence — We are committed to producing high-quality work and solutions based on integrity, transparency, sustainability, and global standards of achievement. We will maintain the highest standards by continually measuring and improving our outcomes.

Innovation — We strive to be global leaders in musculoskeletal research, education, and knowledge translation through a focus on excellence, targeted and strategic growth, learning, and development of novel solutions to musculoskeletal health challenges.

Collaboration — We use a multidisciplinary team approach to problem-solving that results in innovative, comprehensive solutions for improving the musculoskeletal health of patients.



Executive Summary



Over the past five years, the McCaig Institute for Bone and Joint Health has made great progress towards its goals of excellence in research, education, and the community. Moving forward with its new five-year plan, the McCaig Institute will continue to grow its expertise in precision medicine while expanding its research and education mandates and introducing a new focus on “impact.”

The strategic research goal is to build a comprehensive platform to facilitate transdisciplinary musculoskeletal research that will have a global impact. The infrastructure developed over the past five years, including the launch of the Centre for Mobility and Joint Health and the *Mobility for Life* program, as well as improvements to existing

biomechanics infrastructure position the McCaig Institute for success in achieving this goal. The research strategy will focus on facilitating transdisciplinary research and fostering a culture of mentorship and collaboration; utilizing platforms to capitalize on emerging areas of research; and creating sustainability around critical core infrastructure.

To have continued success in research, the McCaig Institute is also committed to creating future leaders in bone and joint health that have multidisciplinary training integrating musculoskeletal specific basic science and clinical knowledge. Providing a robust training environment for our trainees is a critical focus over the next five years and will incorporate additional opportunities for clinical engagement and leadership development for students, post-doctoral fellows, and high-quality personnel.

The McCaig Institute’s ultimate goal is to help everyone maintain “mobility for life” across the lifespan. With people at the centre of all the McCaig Institutes work, our final goal focuses on translating research into impact for the community through clinical translation, knowledge translation, and commercialization of innovations from within the McCaig Institute. This will include the creation of an “impact investment”, communication strategies supporting knowledge translation and clinical implementation; and celebrating impact stories from across the institute.

The new five-year plan is ambitious but achievable with a focus on building on existing strengths to take advantage of new opportunities as they emerge. The McCaig Institute has a long history of transdisciplinary research and clinical engagement. These foundational principles will be enhanced with an additional focus on equity, diversity, and inclusion as well as strategic partnerships and integrating the patient into the centre of our work. Together, these foundational values will support the execution of the new five-year plan and allow the McCaig Institute to continue on its trajectory of success.

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The McCaig Institute for Bone & Joint Health

Introduction

The McCaig Institute for Bone and Joint Health, housed in the Cumming School of Medicine at the University of Calgary, has been conducting research and providing training opportunities in the field of musculoskeletal (MSK) health for over 35 years in Alberta. From the beginning, the McCaig Institute has worked as a collaborative team of researchers and clinicians in the areas of medicine, engineering, and kinesiology to find solutions to bone and joint disease and MSK injury to improve the lives of patients. This long history of MSK collaboration at the McCaig Institute has allowed us to build infrastructure that makes Alberta a leader in bone and joint research for Canada and internationally.

Today, the McCaig Institute is one of the most comprehensive MSK research centres in Canada, with expertise spanning basic discovery to clinical implementation and health systems improvement. Through research excellence and leveraging multidisciplinary teams comprised of basic scientists, orthopaedic surgeons, rheumatologists, radiologists, kinesiologists and biomedical engineers, the McCaig Institute has become a global leader in MSK research. To achieve its goal of “Mobility for Life”, the McCaig Institute focuses on improving the diagnosis, treatment and prevention of bone, muscle and joint disease and turning evidence-based research into real-world solutions. The McCaig Institute has over 100 faculty, 110 staff and 185 trainees at the University of Calgary and the University of Alberta

The Last Five Years

In 2016 with the appointment of Dr. Steven Boyd as the McCaig Institute’s director, a five-year strategic plan was launched. The plan introduced the McCaig Institute’s vision of “leading the improvement of musculoskeletal health for patients across their lifespan through research and education” and emphasized building on the institute’s past success in the areas of research, education, and supporting the community.



The research strategy focused on enhancing the McCaig Institute’s capabilities in precision medicine, a concept that begins and ends with the patient and utilizes clinical problems to drive research. This was realized through the launch of the new Centre for Mobility and Joint Health (MoJo), a clinical research centre that is a hub where physicians, basic scientists, biomedical engineers, patients, and the Alberta Health System collaborate to keep Albertans moving. Over the duration of the strategic plan, we built upon our capacity to address research questions across a full spectrum of health research, implementing new programs, initiatives, grants, and scholarships that facilitate collaboration and transdisciplinary research. In addition to launching the MoJo, key research investments over the last five years included

enhancing the biomechanics lab to maintain a world-class research program in bone and joint health and hiring a biomechanics technician to support research in the institute, particularly for orthopaedic surgeons with an interest in conducting research to compliment their clinical practice. The McCaig Institute also launched the *Mobility for Life Project*, a prospective cohort study that will create a platform for musculoskeletal health research and foster interdisciplinary research and collaborations.



Highlights of Success from 2016 – 2021 Strategic Plan

- Recruitment of two new academic faculty and six clinical faculty members.
- Launched the Centre for Mobility and Joint Health (2016) and grew research projects and revenues 3-fold from 2017 to 2019.
- Invested in our biomechanics lab to maintain a world-class research program in bone and joint health.
- Launched the *Mobility for Life Project* (2019) and ready to start Phase I study recruitment.
- Raised \$360,000 through the “Encore: Music in Motion” event to create “Encore Seed Grants” to promote research in the newly launched Centre for Mobility and Joint Health.
- Granted \$200,000 over four years to 20 clinician-scientist seed grants to encourage new research collaborations.
- Established new initiatives to support research activities in the institute, including the clinician-scientist “speed dating” event; a distinguished speaker series; an open-access author’s fund; and blue-sky sessions for early grant development feedback.
- Provided over \$273,700 in studentships for trainees ranging from summer students through to postdoctoral fellows.
- Established the McCaig Trainee Committee and High Quality Personnel (HQP) committee to enhance engagement and gain deeper insights into the needs of trainees and staff, respectively.
- Continued to grow the institute’s signature public event, the Wood Forum.
- Established the annual Cy Frank Legacy Lectureship to commemorate the memory of Dr. Cy Frank.
- Established and grew Tenet I2C competition, awarding \$200,000 in the first two years for the top companies with potential to commercialize products out of the CSM.
- Developed and executed a comprehensive communications strategy to improve transparency, build a sense of community, enhance communication about institute activities, and celebrate the successes of McCaig Institute members.

Training the next generation of researchers, clinicians, and leaders in MSK health has always been an integral part of the McCaig Institute's mission and the education strategy aimed to provide a high quality, interdisciplinary training program in MSK health. Trainees in the institute include summer students, master's and PhD graduate students and post-doctoral fellows as well as medical residents who have access to the McCaig Institute's resources for supporting training in MSK health. Over the past five years, the institute grew its student community by providing access to scholarships, programs, workshops, and funding for special training opportunities.

Community was also a critical component of work conducted over the past five years. Our signature public event, the Wood Forum, has grown substantially to provide the public access to high quality research information and the opportunity to directly connect with clinicians, scientists, and community practitioners to provide support for key bone and joint related issues. The McCaig Institute established the annual Cy Frank Legacy Lectureship to commemorate the memory of Dr. Cy Frank and has hosted world renowned medical leaders who are exemplars of Cy's vision, innovation and community engagement in health research and healthcare delivery. Another critical element for translating research into benefit for our community is supporting innovation and commercialization of research. The McCaig Institute established and grew the Tenet Innovation to Commercialization (I2C) program awarding \$200,000 in the first two years for top companies with potential to commercialize products out of the Cumming School of Medicine (CSM). The program has evolved to be a part of the Hunter Hub for Entrepreneurial Thinking, proving its great success.



The last five years have seen great successes while simultaneously overcoming many challenges including budget cuts and maintaining operations through a global pandemic. The McCaig Institute has continued to build upon its excellence as a global leader in bone and joint health through these challenging times and will continue to support its researchers, trainees, and community over the next five years with a new, ambitious strategic plan.

The McCaig Institute Today

The work over the last five years has established many programs and initiatives that help create a rich research and training environment for our members. Appendix I highlights the key activities, research and training supports that are available to our members. Additionally, the McCaig Institute has made investments in our core research infrastructure and platforms including the biomechanics lab, the Centre for Mobility and Joint Health, and the *Mobility for Life Project*. These investments have been important for building a critical mass of expertise and will provide support for research programs across the spectrum of bone and joint health research.

The Centre for Mobility & Joint Health (MoJo)

The Centre for Mobility and Joint Health (MoJo) is a patient-focused, comprehensive research centre capable of studying cells, tissues and organs using advanced imaging techniques integrated with functional mobility and biomarker profiles. Using bioinformatics, researchers can analyze this biological information to phenotype patients with a wide array of conditions and diseases. This process allows researchers to create personalized treatment plans that ensure the efficient use of the healthcare system and resources. The McCaig Institute has significant research expertise and capacity in inflammatory arthritis. We will build on this strength to develop a new research paradigm based on value-based decision making in precision medicine for MSK health. The infrastructure developed will expand beyond inflammatory arthritis to study other key MSK diseases, including osteoarthritis and osteoporosis.

A new position was created in May 2019 to increase utilization of the MoJo facility and actively support orthopaedic surgeons wishing to engage in research. The role is jointly funded between the McCaig Institute and the Section of Orthopaedics. To date, the research facilitator has assisted primarily with grants, and provides support with stakeholder engagement, new project development, and identification of funding opportunities. Over the next year, we will raise awareness of services available to McCaig members and our plan to support researchers achieve their goals.



The MoJo has become an important piece of core infrastructure at the Cumming School of Medicine supporting critical clinical imaging research across multiple departments, institutes, and faculties at the University of Calgary. This facility has become a hub for clinicians, scientists, and community partners to come together to form transdisciplinary teams to undertake important medical research. Utilization is rapidly increasing as reflected, for example, in the increase from 15 studies in 2017 to 45 studies in 2019, with research revenues increasing 3-fold during that time. The pandemic in 2020-2021 affected the activities in the MoJo, but we were able to continue our work albeit at a slower rate. The McCaig Institute has been providing in-kind funding to early career researchers through

subsidized access to the facility worth \$513,430 to date. In direct support, the McCaig Institute and its research-intensive members have supported 3.2FTE staff (imaging technologists, research coordinators) for the past five years. Strategies to increase sustainability have included developing community partners with radiology providers (e.g. Pureform Radiology, Mayfair Diagnostics, AHS Diagnostic Imaging), local start-ups (e.g. Ammolite Biomodels), institutional facilities (e.g. Heritage Medical Research Centre, Ward of the 21st Century, Advanced Technical Skills Lab), and researchers who obtain external funding (e.g. Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council, foundations, etc.).

The MoJo is also a critical piece of infrastructure for the University of Calgary to move forward in its “Growth through Focus” strategy and support innovation in health care and diagnostic imaging. The facility naturally aligns with the University of Calgary’s priorities to attract clinical trials, mobilize transdisciplinary teams, generate revenue from existing infrastructure, and support entrepreneurship and innovation. Future work will continue to build partnerships to increase revenue generation so that the facility can ultimately become self-sustaining.

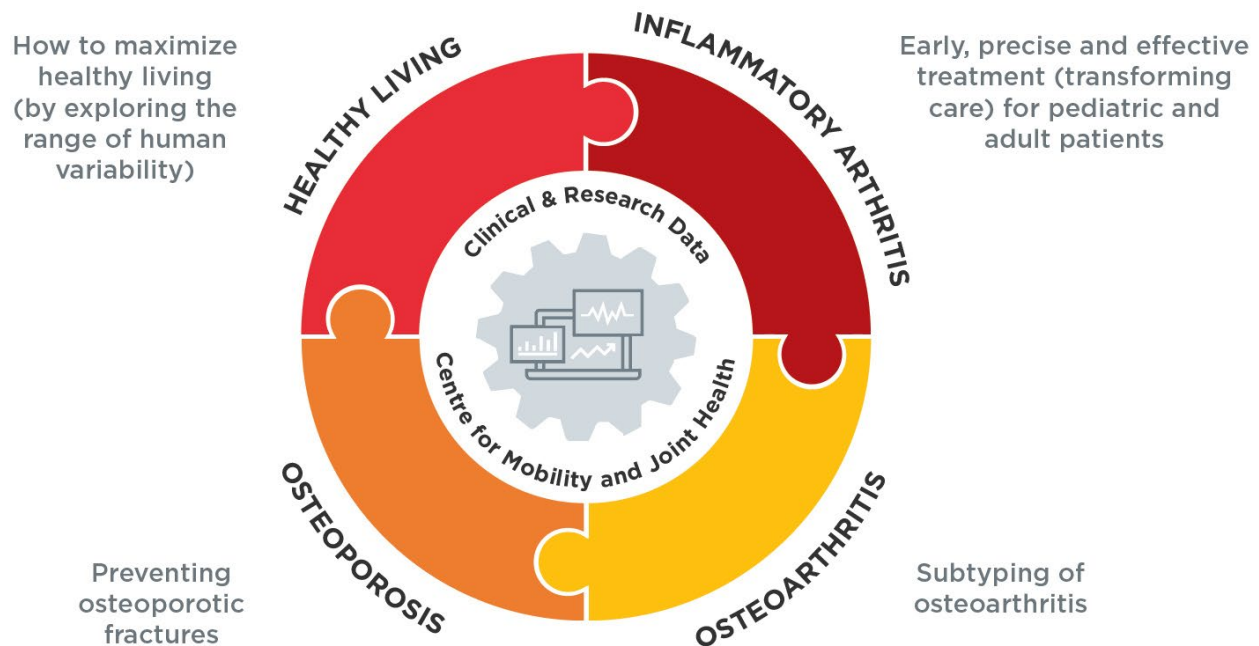
The Mobility for Life Project



Launched in 2019, the *Mobility for Life Project* is a prospective cohort study that will create a platform for musculoskeletal health research and foster interdisciplinary research and collaborations. Thousands of Albertans with and without bone and joint conditions will be asked to participate to help researchers identify early indicators of disease, improve diagnosis, and target effective treatment. The large target pool of 10,000 pre-qualified participants in the M4L cohort serves as a platform for studies focused on MSK to accelerate research and support intradisciplinary and innovative projects.



In Phase I, thousands of participants will be recruited, using active and passive methods, and consented to participate in the study. Individuals will be asked to complete a set of questionnaires that collect information on demographic characteristics, lifestyle, health history and physical function. The survey will be administered annually. A pilot study for Phase I was launched in February 2021 to test the feasibility of the project and methods. Phase II of the study will engage research



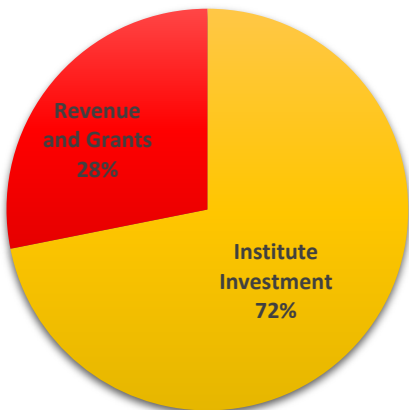
projects on sub-cohorts requiring in-person measures on site at the McCaig Institute. The launch of Phase II of the project has been postponed until it is safe and reasonable to resume in person studies on the University campus.

Phase II of the project will build on existing expertise within the McCaig Institute in the areas of inflammatory arthritis, osteoarthritis, and osteoporosis with clinical and academic leads in each sub-cohort. Additionally, researchers will explore what optimal health looks like in the “healthy living” portion of the cohort. The leads of each portion of the cohort will help to identify new research directions and engage other researchers in opportunities to participate with studies as part of the M4L project.



Biomechanics Lab

**Total Investment into
Biomechanics Lab**

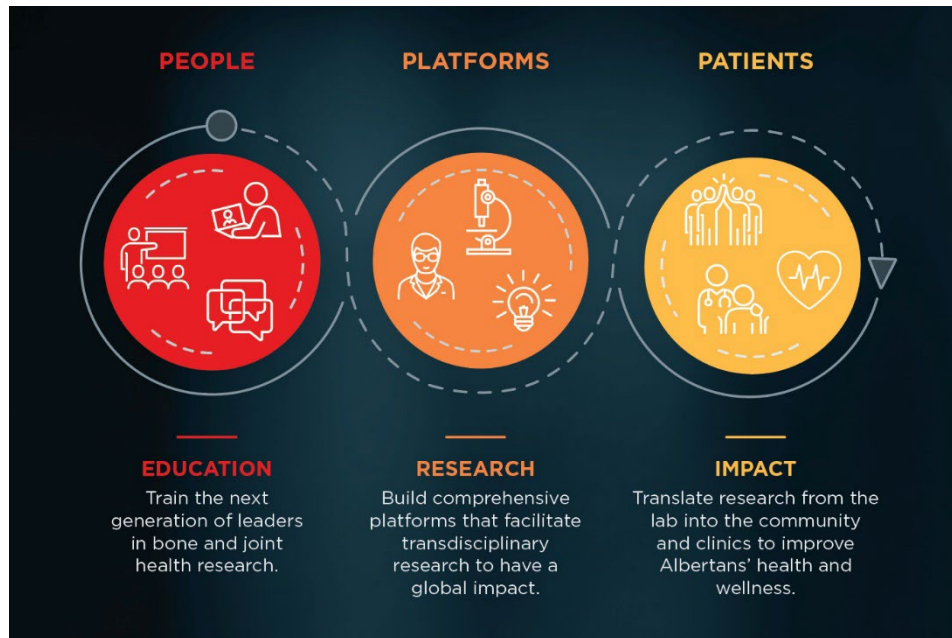


The McCaig Institute Biomechanics Lab is a fully functional biosafety level-two facility equipped with biomechanical testing devices that can apply static and dynamic loads in compression, tension, torsion, and bending. Testing can be accommodated across multiple dimensional scales from the cellular level to organs. The facility also includes a surgical suite, tissue preparation room, a FaroArm, freezer space, and technical expertise to support these facilities.

Strategic investment in the biomechanics lab included \$113,000 in upgraded equipment and maintenance to support our research programs and the hiring of a full-time biomechanics technologist in 2017. A \$50,000 grant was received from the Flames Foundation to support new equipment in the Biomechanics Lab, and over \$63,600 of the technician's salary has been recovered through contracted services (e.g., Schulich School of Engineering).

Summary of Strategic Plan

The new strategic plan will continue to build upon the momentum from the last five years and grow strategic initiatives to have a greater impact for our community. The focus of this plan will be to support excellence in research and education which can be translated into impact for our community.



People are at the foundation of the McCaig Institute. Our researchers and trainees are what drive innovation and make our research programs a success. The new strategic plan will focus on supporting and developing researchers and trainees by creating an environment in which they can thrive. This will include providing them with the necessary resources for success such as funding, mentorship, and strategic partnerships that will facilitate their research and educational goals.

Critical to supporting the people in the McCaig Institute are research platforms and core infrastructure. These platforms will enhance research programs across the spectrum of bone and joint health research and facilitate transdisciplinary interactions. Facilities like the Biomechanics Lab and MoJo and programs like the *Mobility for Life Project* create opportunities for researchers to build upon the success of the institute collectively and strengthen research programs across our entire membership, leveraging the strengths of our team.

Our people and platforms will enable us to make an impact by translating research into improved health and clinical outcomes for patients and people in the community seeking to improve their bone and joint health and stay active. Our strategies for creating an impact-focused culture will ensure that the work conducted in the McCaig Institute can have a global impact through knowledge translation, clinical implementation, and commercialization of innovation.

Strategic Priorities Framework

Foundational Principles

There are several principles that are foundational to the McCaig Institute's success and span across all three strategic areas. The McCaig Institute has a long history of transdisciplinary research and clinical engagement. These values will be built upon with an additional focus on equity, diversity, and inclusion as well as on building new strategic partnerships and incorporating patients more centrally into our work. These foundational principles will support work in all three of the strategic priority areas and enhance the quality of the institute's research and programs.

Strategic Priorities Framework



Equity, Diversity, and Inclusion

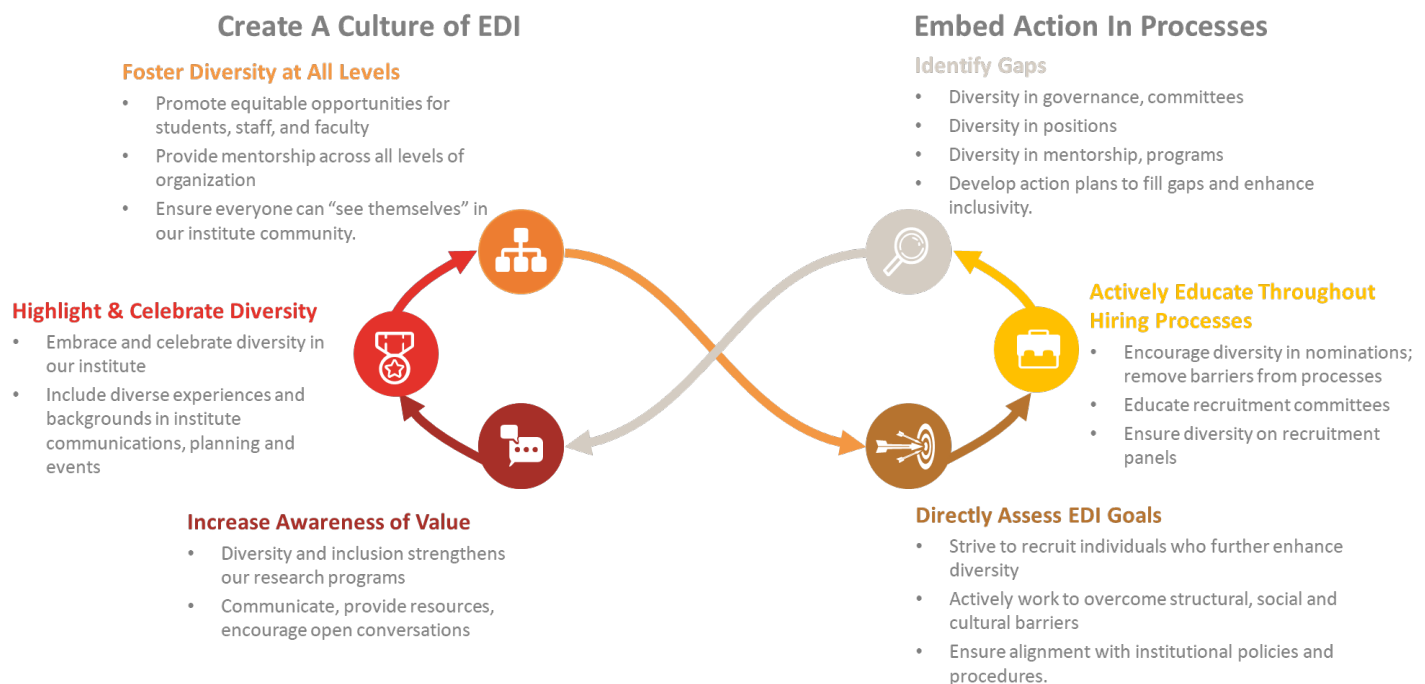
The University of Calgary is making a strong commitment to ensuring equity, diversity, and inclusion (EDI) is demonstrated across our campus and supportive strategies are being integrated into institutional policies and procedures. This extends to Canada Research Chair (CRC) allocations, recruitment processes, and nominations, ensuring equity and diversity considerations are embedded at all stages of the processes and are based on best practices. The McCaig Institute fully supports and adheres to these practices and those outlined by the federal government in our day-to-day operations, strategic level planning, and recruitment and retention practices.

Consistent with the University of Calgary's EDI awareness strategy and action plan, the McCaig Institute utilizes practices to create a culture of inclusion within the McCaig Institute while simultaneously taking actions to identify and resolve underrepresentation and actively work to overcome structural, social, and cultural barriers that exist within our institution. These practices help us to provide a supportive and inclusive workplace for all faculty, staff, and students. Guidelines for recruitment of faculty and staff positions that promotes EDI principles can be found in Appendix II.

To ensure EDI is integrated in meaningful ways throughout the McCaig Institute's practices, the McCaig Institute will identify an "EDI Champion" who will work with a committee to identify opportunities to enhance EDI within the McCaig Institute and act as a resource for committees, reviewing any new processes and initiatives to ensure that they meet EDI standards.



Equity, Diversity & Inclusion Action Plan



Transdisciplinary Research

A transdisciplinary approach to research brings together investigators from different disciplines to drive discovery and translation of innovations. The solutions developed utilizing a transdisciplinary approach go beyond discipline-specific approaches to address problems resulting in more innovative and effective solutions. The McCaig Institute was built upon this foundational principle and brings together members from across the University of Calgary in the Cumming School of Medicine, Schulich School of Engineering and faculties of Kinesiology, Nursing, and Veterinary Medicine as well as and the University of Alberta’s Faculty of Rehabilitation Medicine. Over the past five years, multiple initiatives and grants have been developed to encourage collaboration across disciplines to create new projects. These initiatives will continue to be supported and actively grown to engage other clinicians and faculty across departments and faculties not currently involved in collaborations with McCaig Institute members.

Strategic Partnerships

Strategic partnerships with industry and community groups can support the McCaig Institute’s goals across its research, education, and impact strategies. Industry partnerships can provide unique opportunities for sponsored research projects and partnership with clinical organizations ensures that research is being conducted on clinically relevant problems. In education, industry partnerships can provide new career opportunities and unique training experiences for McCaig trainees. And partnerships with both industry and community groups like the Alberta Health Services’ Bone and Joint Health Strategic Clinical Network (BJHSCN) can expedite implementation of new evidence-based practices and innovations.

Developing and maintaining strategic partnerships will be a foundational priority for the strategic plan as opportunities can be explored to impact multiple strategies.

Clinical Engagement

Like strategic partnerships, clinical engagement is a critical element to all of three strategic priority areas and has been a foundational principle for the McCaig Institute since its inception. While there is strong engagement from some clinical groups including orthopaedic surgeons and rheumatologists, there are many opportunities to grow by engaging clinicians across multiple medical specialties including radiology, endocrinology, physiatry, and neurology to name a few. A key element of the McCaig Institute’s five-year plan will be to build upon existing clinical partnership to reach out to more clinicians across a broader range of fields to further enhance the McCaig Institute’s “clinical pull” model and expand multidisciplinary teams.

Patients

Our community, including patients and healthy individuals, is at the heart of everything we do at the McCaig Institute. We not only want to treat and cure bone and joint conditions to help patients today, but also prevent injury and disease to allow Albertans to stay mobile and active throughout their life. Patients and community members need to be meaningfully engaged to enhance research, education, and impact strategies. One way the McCaig Institute will do this will be to create a community advisory committee that contains diverse representation of patients and community members as well as strategic partners that can help to guide and provide feedback on our research programs.



Future Change Makers

Creating a fund to develop leadership competencies to complement musculoskeletal expertise so our trainees can create the future of health.

Mobility for Life Project

Bringing together researchers from across disciplines with the community to co-create the future of bone and joint health.

Entrepreneurial Thinking

Supporting researchers of all levels to engage in entrepreneurial thinking and transform research into clinical and commercial opportunities that impact Albertans' health.

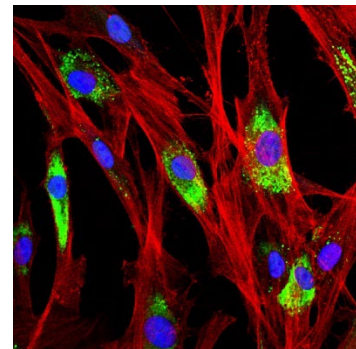
Foundational Principles

Equity, Diversity & Inclusion; Transdisciplinary Research; Strategic Partnerships; Clinical Engagement; Patients

Research Strategy

Strategic Goal: Build a comprehensive platform to facilitate transdisciplinary MSK research that will have a global impact

Over the past five years the McCaig Institute has focused on research excellence in precision medicine for MSK health and has established programs, initiatives, and research infrastructure in support. The new strategic plan will build upon this research excellence and further develop a comprehensive platform that brings together data from multiple sources and empowers researchers to share and access large volumes of data from a longitudinal cohort. This goal will bring together researchers from across the University of Calgary campus and across the country in transdisciplinary teams that will have access to research participants who have already consented to be part of studies and have baseline data being collected over many years. The platform will enable researchers to take advantage of emerging opportunities in MSK research including artificial intelligence (AI), machine learning (ML) and wearable technologies. A key focus for the strategy will be creating sustainability around core research infrastructure to ensure the McCaig Institute will remain at the leading edge of MSK research capabilities.



To achieve this goal, the McCaig Institute will focus on the strategies summarized below. Activities for each of the objectives are provided as examples, however, specific activities and metrics for success will be developed on an annual basis as part of the annual implementation planning process.

Research Goal: Build a comprehensive platform to facilitate transdisciplinary MSK research that will have a global impact.			
Strategies	Objectives	Sample Activities	Metrics
Strategy 1: Facilitate transdisciplinary research and foster a culture of mentorship and collaboration.	Objective 1.1: Strategically engage researchers across multiple departments, institutes, and faculties to participate in the <i>Mobility for Life Project</i> (M4L)	<ul style="list-style-type: none"> Pediatric imaging program with ACHRI WeTrac collaboration 	<ul style="list-style-type: none"> # of researchers involved in M4L (by dept/faculty)
	Objective 1.2: Facilitate creation of team grants to support research priorities within the McCaig Institute.	<ul style="list-style-type: none"> Bring together groups for applications (NSERC CREATE) Provide support for grant writing 	<ul style="list-style-type: none"> # of team grants applied for # of successful grants
	Objective 1.3: Facilitate interactions between researchers and clinicians in each of the Mobility for Life Project sub cohorts.	<ul style="list-style-type: none"> Clinician-Scientist “Speed Dating” event 	<ul style="list-style-type: none"> # of events/initiatives facilitating interactions # of participants in events to create interactions
	Objective 1.4: Provide funding to support transdisciplinary research that supports research priorities within the McCaig Institute.	<ul style="list-style-type: none"> Seed grants 	<ul style="list-style-type: none"> # of grants awarded \$ of grants awarded
	Objective 1.5: Provide opportunities for formal and informal mentorship with institute members that support their career goals.	<ul style="list-style-type: none"> Blue sky sessions Mentorship matching 	<ul style="list-style-type: none"> # of formal mentorship relationships # of informal mentorship opportunities
	Objective 1.6: Engage new clinicians who may have limited dedicated time for research by supporting clinical research programs that strengthen their connection to the institute.	<ul style="list-style-type: none"> “Speed dating” events 	<ul style="list-style-type: none"> # of new clinician scientists
Strategy 2: Utilize platforms to capitalize on emerging areas of research.	Objective 2.1: Invest in projects that leverage the M4L project and data to facilitate research in emerging areas (e.g. such as wearable technologies and artificial intelligence/machine learning) .	<ul style="list-style-type: none"> Grants Fundraising 	<ul style="list-style-type: none"> # of new research areas # of new research collaborations
	Objective 2.2: Develop strategic partnerships (academic, government, and industry) that leverage data collected through M4L project and MoJo.	<ul style="list-style-type: none"> WeTrac partnership ABJHI BJHSCN Datafinity Academic partners 	<ul style="list-style-type: none"> # of academic partnerships # of government partnership # of industry partnerships

Research Goal: Build a comprehensive platform to facilitate transdisciplinary MSK research that will have a global impact.

Strategies	Objectives	Sample Activities	Metrics
Strategy 3: Create sustainability around core infrastructure	Objective 3.1: Facilitate funding applications to support research infrastructure in the M4L project, the MoJo and Biomechanics lab.	<ul style="list-style-type: none"> Provide support for grant writing 	<ul style="list-style-type: none"> # of grant applications \$ of grants awarded \$ of philanthropic gifts
	Objective 3.2: Explore business models and revenue generation opportunities that leverage data and research infrastructure.	<ul style="list-style-type: none"> Clinical trials Fee for service 	<ul style="list-style-type: none"> \$ revenue generated
	Objective 3.3: Develop strategic partnerships (academic, government, and industry) that support sustainable operations of core facilities.	<ul style="list-style-type: none"> Pureform Mayfair Datafinity 	<ul style="list-style-type: none"> # of academic partnerships # of government partnerships # of industry partnerships

Education Strategy

Education Goal: Create future leaders in bone and joint health that have multidisciplinary training integrating MSK specific basic science and clinical knowledge.

Building upon the successful development of opportunities for McCaig trainees over the last five years, the McCaig Institute's new strategic plan will shift the emphasis from establishing a strong trainee culture to enhancing the formal and informal training opportunities. Our goal is to provide a strong foundation of basic science training in bone and joint specific topics. This will leverage the knowledge of transdisciplinary research across the institute and our partners to ensure trainees have access to foundational training across multiple disciplines and provide a well-rounded education in MSK health. The Institute will focus on facilitating clinical engagement and interactions for trainees that will help to apply their foundational knowledge to real-world problems and clinical practice. It will be important to continue to support overall career and leadership development for trainees to develop the highest quality future leaders in MSK health.



Education Goal: Create future leaders in bone and joint health that have multidisciplinary training integrating MSK specific basic science and clinical knowledge

Strategies	Objectives	Sample Activities	Sample Metrics
Strategy 1 Provide a strong foundation of basic science training in bone and joint specific topics.	Objective 1.1: Create educational opportunities with MSK specific content ranging from short courses to full training programs.	<ul style="list-style-type: none"> Micro credentials Intensive courses Workshops NSERC CREATE program 	<ul style="list-style-type: none"> # of courses provided # of students attending # of trainee publications # of trainee abstracts # of trainees graduated
	Objective 1.2: Provide educational opportunities on emerging areas of expertise and areas critical to graduate student success.	<ul style="list-style-type: none"> AI/ML Statistics 	<ul style="list-style-type: none"> # of courses provided # of students attending

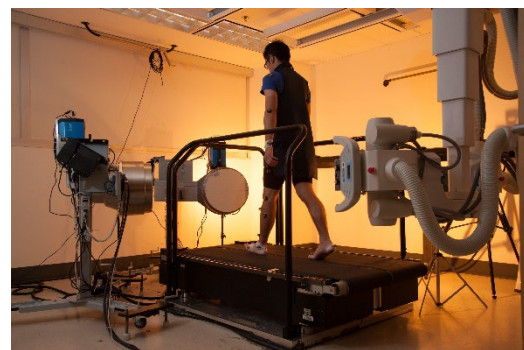


Strategy 2: Facilitate clinical engagement and interaction for trainees.	Objective 2.1: Create opportunities for trainees to interact with medical students, residents, and fellows in key MSK areas of physiatry, sports medicine, orthopedics, rheumatology, radiology, internal medicine, and endocrinology.	<ul style="list-style-type: none"> • Trainee speed dating event 	<ul style="list-style-type: none"> • # programs/events facilitating interactions • # of participants in programs/events
	Objective 2.2: Create a new program linking proposed clinical challenges and problems from clinical members (residents, fellows and clinicians) to graduate students.	<ul style="list-style-type: none"> • Program for clinicians, residents, and fellows to work with undergraduate BME capstone project course 	<ul style="list-style-type: none"> • # of clinicians in program • # of students in program • # of projects
Strategy 3: Support career and leadership development.	Objective 3.1: Create a \$2.5 Million endowment to provide scholarships for graduate students (MSc/PhD) to attract the best national and international students.	<ul style="list-style-type: none"> • Fundraising 	<ul style="list-style-type: none"> • # of scholarships • \$ of scholarships
	Objective 3.2: Create partnerships with industry to help facilitate opportunities for trainees to get industry experience and connect with experts from industry.	<ul style="list-style-type: none"> • Develop a program for “College of industry partners” 	<ul style="list-style-type: none"> • # of partnerships • # of industry presentations • # of alumni engaged in network

Impact Strategy

Impact Goal: Translate research into impact for the community through clinical translation, knowledge translation, and commercialization.

The goal of all McCaig Institute faculty, staff, and trainees is to improve the quality of life for people who suffer from bone and joint conditions and to reduce or eliminate MSK disease. This can only be achieved by translating the research, innovation, and knowledge generated into solutions for the prevention and treatment of bone and joint injury and disease. The McCaig Institute maintains strong relationships with the community it serves and strives to provide opportunities for community members to interact with McCaig Institute members through public events and to benefit from new knowledge as it is being created. Over the next five years these efforts will be enhanced and strengthened through strategic partnerships with industry,



the healthcare system, and the community. New opportunities for investment in our impact strategy will be created through an “impact investment” framework that will allow for donors to contribute to projects that are ready to scale and spread to have an impact on health and healthcare today. Our communications strategies will be enhanced to support knowledge translation, clinical implementation, and commercialization of innovations in bone and joint health so that we can have a greater impact in the community. Our communications will also celebrate our research and education excellence and celebrate impact stories from across the institute to more effectively demonstrate the effect our research is having in the community.

Impact Goal: Translate research into impact for the community leading to improved health and health outcomes.			
Strategies	Objectives	Sample Actions	Sample Metrics
Strategy 1: Create an “impact investment” framework to attract donations and support programs ready to scale and spread.	Objective 1.1: Identify clinical projects that are being piloted and support development of plans to scale and spread programs across the province.	<ul style="list-style-type: none"> Testing new surgical devices Testing mobile applications (apps) to inform patients 	<ul style="list-style-type: none"> # of clinical projects identified \$ invested in translational research projects
	Objective 1.2: Identify and support research projects (discovery or translational) that have commercial potential that would benefit from investment.	<ul style="list-style-type: none"> Wayfinding of existing opportunities within the Hunter Hub Provide support to connect projects to the University of Calgary entrepreneurial ecosystem (e.g. the Hunter Hub, the Life Science Innovation Hub, Innovate Calgary) 	<ul style="list-style-type: none"> # of commercial projects identified. # of projects supported with feasibility analysis
Strategy 2: Develop a communications strategy that supports knowledge translation, clinical implementation, and commercialization.	Objective 2.1: Disseminate information about important topics in bone and joint health research and elevate the profile of the McCaig Institute.	<ul style="list-style-type: none"> Podcast 	<ul style="list-style-type: none"> # of podcast episodes # of listeners
	Objective 2.2: Develop a formal framework for working with the Bone and Joint Health Strategic Clinical Network (BJHSCN) to facilitate translation of research into clinical practice.	<ul style="list-style-type: none"> Pilot projects for clinical implementation 	<ul style="list-style-type: none"> # of projects utilizing BJHSCN partnership for support
	Objective 2.3: Develop a communication strategy to attract partnerships and funding based on outcomes.	<ul style="list-style-type: none"> Impact stories Grateful patient 	<ul style="list-style-type: none"> # of donations \$ of donations # of partnerships
Strategy 3: Promote and celebrate impact stories across the institute.	Objective 3.1: Create a mechanism for continually identifying, collecting, and documenting impact of research.	<ul style="list-style-type: none"> Database of research impacts 	<ul style="list-style-type: none"> # of impact stories
	Objective 3.2: Integrate impact stories into existing institute communications strategies and create a culture of celebrating the impact of research.	<ul style="list-style-type: none"> Impact stories subpage on website 	<ul style="list-style-type: none"> # of impact stories



Conclusion & Next Steps

To execute the strategic plan, the McCaig Institute leadership team and operations team will develop annual implementation plans. This process will include an annual review of progress towards the goals outlined in the strategic plan and a review of the metrics being monitored to measure success. In conjunction with the annual budgeting process, actions and annual targets will be set to ensure progress is made on each objective and quarterly reporting will ensure accountability is maintained throughout the year.

Significant progress at the McCaig Institute has been made in the past five years toward stability, a sense of community, and the launch of new projects. The next years will build upon those successes and work towards increasing our impact at the university of Calgary and beyond. We are presented with opportunities at the institutional level by aligning with “Growth Through Focus” and are well positioned to capitalize on our intrinsic ability to conduct transdisciplinary research and education. It is an exciting time at the Cumming School of Medicine to work with other institutes, all of whom have new and energetic leadership, toward these institutional goals and our faculty’s focus on “precision medicine.”



Appendix I: McCaig Institute Research Supports

Programs & Events

Research

- **Seminar Series:** The weekly McCaig Institute Seminar Series is an opportunity for interdisciplinary exchange of knowledge and ideas. Seminar topics and speakers, organized by a group of student leaders, reflect the breadth of research at the institute. Trainees, principal investigators, and special guests give presentations on topics of research or professional development. The seminar series creates an opportunity for trainees, staff, and faculty to broaden their knowledge and receive feedback while promoting a sense of community within the institute.
- **Speed-Dating Event:** Our annual scientific “speed dating” event is held to facilitate interactions between clinicians and scientists that may have similar research interests for the purpose of stimulating new research collaborations. The event gives McCaig Institute members the opportunity to get to know one another, learn about new areas of research underway that they may have synergies with, and provide an environment in which new partners can be identified to strengthen projects. Clinicians and scientists who attend the speed-dating event are encouraged to submit proposals for the Seed Grant competition.
- **McCaig Distinguished Speaker Series:** The McCaig Distinguished Speaker Series promotes higher learning and collaboration at the McCaig Institute by providing up to \$3,000 in support to bring in distinguished speakers. Proposed speakers need to be national or international leaders in bone, joint and muscle health research. There will be an effort to ensure that speakers and topics reflect the breadth of research happening at the McCaig Institute.
- **McCaig Institute Research Day:** The McCaig Research Day, supported by the Grace Glum Professorship, is a day-long event where investigators and trainees present oral and poster presentations highlighting the research being done within the McCaig Institute. The research day also features two key-note speakers who are international experts in the field of bone, joint, and muscle research.
- **McCaig Institute Summer Student Symposium:** Organized by our McCaig Trainee Committee, a summer student symposium is held at the end of the summer to allow summer students the opportunity to present the work they completed over the previous four months. Awards are given for the best oral presentations of the day. It is a celebration of excellence for our young trainees.

Education

- **Career Conversations:** The McCaig Institute Career Conversation initiative is a series of compact, low burden learning experiences specific to musculoskeletal research and academic career success. The one-hour seminars are facilitated by volunteer McCaig members and cover a range of topics related to being a successful researcher. The initiative elevates the training experience and contributes to the trainees’ success in a diverse range of future careers.
- **McCaig Institute Three Minutes Thesis (3MT) contest:** Three Minute Thesis (3MT™) is an internationally recognized research communication competition which challenges thesis-based graduate students to deliver a compelling presentation on their research and its significance in three minutes or less. The McCaig Institute 3MT acts as both a stand-alone event where three winners share prize money totaling \$1,000 and as a practice session for the campus-wide event hosted by UCalgary in late March each year.

Community

- **Wood Public Forum:** The Wood Public Forum is an initiative supported by the Wood Joint Research Fund, established in 1994 to honor the memory of Dr. John and Mrs. Christena Wood. These forums raise public awareness about the prevention, causes and consequences of joint injuries and disease, and give the public the opportunity to discuss research findings and treatment options with leaders in the field.
- **Cy Frank Legacy Lectureship:** Dr. Cy Frank was an orthopedic surgeon, scientist, longtime faculty member in the Cumming School of Medicine and a founder of the McCaig Institute. At the time of his death in 2015, he was the director and CEO of Alberta Innovates — Health Solutions. Dr. Frank was internationally acclaimed for his

visionary efforts to lead and champion the value of multidisciplinary research to create innovative solutions for clinical care. The Cy Frank Legacy Lectureship showcases the work of individuals who reflect his passion and commitment to health innovation. The lectureship will take place annually in multiple locations across Canada.

Funding Opportunities

Research

- **Encore Catalyst Grants:** Encore Catalyst Grants are competitive, non-renewable internal awards of up to \$30,000 intended to stimulate new and novel research occurring within the Centre for Mobility and Joint Health (MoJo) that will maximize the use of the MoJo (motion analysis, imaging and biomarker equipment). Candidates for Encore Catalyst Awards are encouraged to form small-sized, collaborative teams led by a member of the McCaig Institute for Bone and Joint Health.
- **Clinician-Scientist Seed Grants:** Following the scientific speed-dating event, \$10,000 awards are available to support new projects that involve a clinician and scientist collaboration and are intended to support projects or generate pilot data that will develop or strengthen collaborations between clinicians and basic scientists at the McCaig Institute.

Education

- **Special Training Opportunities Fund:** This scholarship provides funding to McCaig Institute trainees and highly qualified personnel (HQP) to pursue experiences related to their academic goals and professional development. For example, if a trainee wanted to attend a relevant career conference in Vancouver or attend a Calgary-based workshop related to their research, they can apply for funding through the Institute. The fund supports 75% of the proposed costs, the remaining 25% is secured with other funds (e.g., supervisor, graduate program, etc.). After their experience, award holders deliver a brief oral presentation (e.g., seminar series, open house, lunch and learn, etc.) describing what they learned and how it was beneficial to their research or career.
- **Linda Marchuk Memorial Award:** Started in 2018, this scholarship honors the life and work of Linda Marchuk, a long-time McCaig Institute staff member. It awards \$900 annually to a trainee selected on academic merit, community volunteering experience and financial need.
- **Cumming School of Medicine Post-Doctoral Fellowship Awards:** The McCaig Institute participates in the CSM PDF competition each year by supporting up to three post-doctoral fellows in this scholarship competition. The institute matches CSM funding to provide a total of \$25,000/year for up to two years, with the other \$25,000/year being contributed by the McCaig Institute investigators for their eligible post-doctoral fellow. This brings in outstanding PDFs to the institute from across Canada and around the world.
- **Dr. Cy Frank Trainee Award in Nutrition for Bone, Joint, and Muscle Health:** The Cy Frank Trainee award provides up to \$50,000/year to a trainee in the McCaig Institute to support exceptional learning experiences for highly qualified trainees working in nutrition as it relates to bone, joint, and muscle health.
- **R. R. Singleton Summer Studentships:** The R. R. Singleton Summer Studentship Awards are a competitive internal award intended to provide stipend support to undergraduate students pursuing a summer research position, encouraging trainees to explore research has a potential field of study. The award provides a \$1250 monthly stipend to be topped up by an investigator with a minimum of \$375 per month totaling a \$1500 minimum stipend.

Appendix II: EDI Recruitment Guidelines

Recruitment Advertisement:

- The advertisement for the position will explicitly encourage applicants who are members of the four designated groups (women, Indigenous people, persons with disabilities, and members of visible minorities) to apply.
- The posting will go through an equity and diversity review prior to being posted and will contain only qualifications and skills that are necessary for the position. It will use inclusive, unbiased, and ungendered language (“them” instead of “him” and/or “her”) and avoid stereotyping and prioritizing those traits and descriptions that are traditionally viewed as masculine.
- The posting will ask applicants to identify strengths and experiences in supporting and increasing equity, diversity and/or inclusion in their previous environment or curriculum.
- The posting will highlight resources that would serve to attract a diverse group of applicants including institutional supports, community assets and resources, EDI policies and action plans, accommodation policies, and family resources.
- The University of Calgary has signed the Declaration on Research Assessment (DORA). The posting will highlight that while a strong publication record is viewed favourably, other types of scholarly outputs will be valued in the selection process.
- The selection committee will conduct an active environmental scan to determine the demographic composition of the field in which the position is being recruited to ensure that the applicant pool is reflective of this demographic and will proactively seek out and encourage candidates from the four designated groups to apply.

Selection Committee:

- The selection committee will be composed of individuals across different academic ranks, including trainee(s) members, and additionally represent diversity in the four designated groups. Input on the committee composition will be provided by the Associate Dean for Equity and Diversity who will advise the committee chair throughout the process. The chair, or another member of the committee, will be designated as an equity champion to ensure that EDI is embedded throughout all processes related to the recruitment.
- A key component of formation of the committee will include education on EDI. An HR representative and the chair of the committee will discuss rules concerning diversity and citizenship and help ensure there is an understanding of the need and importance of diversity. Education will also include equity training and guidance for all committee members (ex. Training on how to recognize and combat unconscious, implicit, overt, and prejudicial and other biases). Unconscious bias training can be provided by HR.
- The committee will also be educated about the University of Calgary’s goals and commitment to EDI and bring awareness to equity targets and gaps in the institution.
- The committee will actively identify potential biases, stereotypes and micro-aggressions revealed during the discussion and support committee members as they work through them.
- A toolkit for search committees will be provided that include detailed methodology for creating job descriptions that accurately identify necessary skills, experiences, and qualities. It will also provide suggested effective interview questions as well as questions that are impermissible.
- The committee will be provided with advice on how to evaluate applications with non-traditional components.
- The committee will define the selection criteria and assessment process prior to the recruitment being undertaken.

Decision Making:



- The selection decision will consider that the best-qualified candidates may not have the most years of experience, greatest number of publications, or largest numbers of academic accomplishments. This includes ensuring that averaging productive periods across non-productive periods is avoided (ex. Years that are required for parental, family, or medical leaves).
- The committee must consider the value-add of scholarship or research that is non-traditional; outside the mainstream of the discipline; or focused on issues of gender, race, or minority status
- Strategic hiring will be considered when two candidates are approximately equal, meaning there are two equally qualified candidates, and one is from an underrepresented group.

There will be a process to provide faculty senior leadership with rationale for the selection and will provide information related to why a member of a designated group was unsuccessful if they applied.